

Remarks

A. Pending Claims

Claims 411-416, 422-423, and 889-978 are pending in the application. Claims 411-416, 422-423, and 889-978 have been rejected. Claims 411, 412, 422-423, 891-892, 897, 903, 905, 940, 942, 944, 968, 970, and 972 have been amended.

B. The Claims Are Not Obvious Over Halmann In View Of Sheehan Pursuant To 35 U.S.C. § 103(a)

Claims 411-416, 422-423, and 890-920 were rejected pursuant to 35 U.S.C. §103(a) as obvious over U.S. Patent No. 5,151,856 to Halmann et al. ("Halmann") in view of U.S. Patent No. 5,601,084 to Sheehan et al. ("Sheehan"). Applicant respectfully disagrees.

To reject a claim as obvious, the Examiner has the burden of establishing a *prima facie* case of obviousness. *In re Warner et al.*, 379 F.2d 1011, 154 USPQ 173, 177-178 (CCPA 1967). To establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP § 2143.03.

The Office Action states:

Halmann et al does not explicitly disclose assessing a movement of one or more parts of the endocardial wall model between the end-systolic state and the end-diastolic state. In the same field of endeavor (cardiac imaging) and solving the same problem (determining cardiac wall motion), Sheehan et al discloses assessing a movement of one or more parts of the endocardial wall model between

the end-systolic state and the end-diastolic state.

Applicant respectfully submits that the cited art does not appear to teach or suggest the combination of features in claims 411-416, 422-423, and 890-920.

Claim 411 describes a combination of features including, but not limited to, the feature of: “assessing a transmurality of one or more parts of the wall model; comparing the movement to the transmurality to assess a ratio of recoverable heart tissue verses nonrecoverable heart tissue; and comparing the ratio to a predetermined number to assess a state of the heart and an optimal treatment of the heart.”

Halmann appears to teach or suggest a method of displaying cardiac function which forms by helical or segmental analysis a three-dimensional cage model upon which the coronary artery tree including stenosed segments may be superimposed. Sheehan appears to teach or suggest a method for imaging and three-dimensional modeling portions of the heart from which range of movement as well as wall thickness may be calculated. Neither Halmann nor Sheehan, separately, or in combination appear to teach or suggest the combination of features in the claims, including but not limited to “assessing a transmurality of one or more parts of the wall model; comparing the movement to the transmurality to assess a ratio of recoverable heart tissue verses nonrecoverable heart tissue; and comparing the ratio to a predetermined number to assess a state of the heart and an optimal treatment of the heart.”

Applicant submits that many of the claims dependent on claim 411 are separately patentable. Applicant requests removal of the rejections of claims 411-416, 422-423, and 890-920.

C. The Claims Are Not Obvious Over Halmann In View Of Sheehan And Further In View Of Kramer Pursuant To 35 U.S.C. § 103(a)

Claim 889 was rejected pursuant to 35 U.S.C. §103(a) as obvious over Halmann in view of Sheehan and further in view of U.S. Patent Application Publication No. 2004/0015081 to Kramer et al. ("Kramer"). Applicant respectfully disagrees.

If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988).

The Office Action states:

As per claim 889, and as applied to claim 411 above, the Halmann et al/Sheehan et al combination discloses all the elements of the claimed invention except that it does not explicitly disclose assessing movement towards a centerline of the heart. In the same field of endeavor (cardiac diagnosis using medical imaging), Kramer et al discloses assessing movement towards a centerline of the heart (centerline method, paragraph 41).

Applicant respectfully submits that the cited art does not appear to teach or suggest the combination of features in claim 889.

Claim 889 describes a combination of features including, but not limited to, the feature of: "wherein the assessed movement comprises movement towards a centerline of the heart."

Applicant submits that at least for the reasons stated in Section B, dependent claim 889 is nonobvious. Applicant submits that Halmann in view of Sheehan and further in view of Kramer does not appear to teach or suggest the combination of features in claim 889.

Applicant requests removal of the rejections of claim 889.

D. The Claims Are Not Obvious Over Halmann In View Of Kramer Pursuant To 35 U.S.C. § 103(a)

Claims 921-935, 937-963, and 965-978 were rejected pursuant to 35 U.S.C. §103(a) as obvious over Halmann in view of Kramer. Applicant respectfully disagrees.

The Office Action states:

Halmann et al does not disclose assigning regions as dysynchronous or not based on the image data. In the same field of endeavor (cardiac diagnosis using medical imaging), Kramer et al discloses assessing regional dysnchrony quantitatively based on wall motion in medical images (A phase analysis technique provides for quantification of regional wall motion asynchrony from endocardial border contours generated from two-dimensional echocardiographic ventricular images.

Applicant respectfully submits that the cited art does not appear to teach or suggest the combination of features in claim 921-935, 937-963, and 965-978.

Claim 921 describes a combination of features including, but not limited to, the feature of: “assigning a region as dysynchronous if an assessed property of the region is outside the normal range for the region; and assessing a dysynchronous index based on the number of regions assigned as dysynchronous and the number of regions in the normal range.” Claim 947 describes a combination of features including, but not limited to, the feature of: “assign a region as dysynchronous if an assessed property of the region is outside the normal range for the region; and assess a dysynchronous index based on the number of regions assigned as dysynchronous

and the number of regions in the normal range.” Claim 948 describes a combination of features including, but not limited to, the feature of: “assigning a region as dysynchronous if an assessed property of the region is outside the normal range for the region; and assessing a dysynchronous index based on the number of regions assigned as dysynchronous and the number of regions in the normal range.” Claim 949 describes a combination of features including, but not limited to, the feature of: “assigning a region as dysynchronous if an assessed property of the region is outside the normal range for the region; assessing a ranking of dysynchronous regions based on an amount of deviation from the normal range of each dysynchronous region; and providing a template for placement of one or more ventricular pacing leads based on the assessed ranking.” Claim 977 describes a combination of features including, but not limited to, the feature of: “assign a region as dysynchronous if an assessed property of the region is outside the normal range for the region; assess a ranking of dysynchronous regions based on an amount of deviation from the normal range of each dysynchronous region; and provide a template for placement of one or more ventricular pacing leads based on the assessed ranking.” Claim 978 describes a combination of features including, but not limited to, the feature of: “assigning a region as dysynchronous if an assessed property of the region is outside the normal range for the region; assessing a ranking of dysynchronous regions based on an amount of deviation from the normal range of each dysynchronous region; and providing a template for placement of one or more ventricular pacing leads based on the assessed ranking.”

Halmann appears to teach a method of displaying cardiac function which forms by helical or segmental analysis a three-dimensional cage model upon which the coronary artery tree including stenosed segments may be superimposed. Kramer appears to teach a phase analysis technique for quantification of regional wall motion asynchrony from endocardial border contours generated from two-dimensional echocardiographic ventricular images. Kramer appears to teach the technique produces results including a degree of radial ventricular

asynchrony in heart failure patients with ventricular conduction delay to predict a magnitude of contractile function improvement with pacing therapy. Neither Halmann nor Kramer, separately, or in combination appear to teach or suggest the combination of features in the claims, including but not limited to “assess a dysynchronous index based on the number of regions assigned as dysynchronous and the number of regions in the normal range.” Neither Halmann nor Kramer, separately, or in combination appear to teach or suggest the combination of features in the claims, including but not limited to “assessing a ranking of dysynchronous regions based on an amount of deviation from the normal range of each dysynchronous region; and providing a template for placement of one or more ventricular pacing leads based on the assessed ranking.”

Applicant submits that many of the claims dependent on claim 411 are separately patentable. Applicant requests removal of the rejections of claims 411-416, 422-423, and 890-920.

E. The Claims Are Not Obvious Over Halmann In View Of Kramer And Further In View Of Watson Pursuant To 35 U.S.C. § 103(a)

Claims 936 and 964 were rejected pursuant to 35 U.S.C. §103(a) as obvious over Halmann in view of Kramer and further in view of U.S. Patent No. 4,777,962 to Watson et al. (“Watson”). Applicant respectfully disagrees.

The Office Action states:

As per claims 936 and 964, and as applied to claims 921 and 949 above, the Halmann et al/Kramer et al combination discloses all the elements of the claimed invention except that it does not disclose computing a dysynchronous index wherein the dysynchronous index comprises a number of dysynchronous regions divided by a total number of regions in the plurality of regions.

Applicant respectfully submits that the cited art does not appear to teach or suggest the combination of features in claims 936 and 964.

Claim 936 describes a combination of features including, but not limited to, the feature of: “wherein the dysynchronous index comprises a number of dysynchronous regions divided by a total number of regions in the plurality of regions.” Claim 964 describes a combination of features including, but not limited to, the feature of: “assessing a dysynchronous index based on the number of regions assigned as dysynchronous and the number of regions in the normal range, wherein the dysynchronous index comprises a number of dysynchronous regions divided by a total number of regions in the plurality of regions.”

Applicant submits that at least for the reasons stated in Section D, dependent claims 936 and 964 are nonobvious. Applicant submits that Halmann in view of Kramer and further in view of Watson does not appear to teach or suggest the combination of features in claims 936 and 964.

Applicant requests removal of the rejections of claims 936 and 964.

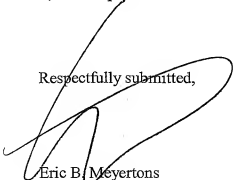
F. Conclusion

Applicant submits that the claims are in condition for allowance. Favorable reconsideration is respectfully requested.

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Applicant respectfully requests a three-month extension of time. A fee authorization form has been submitted to cover fees associated with a three-month extension of time. If any further extension of time is required, Applicant hereby requests the appropriate extension of time. If any further fees are required, or have been overpaid, please appropriately charge, or credit, those fees to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account Number 50-1505/5838-06701/EBM.

Respectfully submitted,



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